Effectiveness and acceptability of low-intensity psychological interventions on the well-being of older adults

Effectiveness and Acceptability of Low-intensity Psychological Interventions on the Well-being of Older Adults: A Systematic Review

Running Head: Low-intensity Psychological Interventions

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Abstract

Objectives: Growth in the older adult population and healthcare inequities mean there is a global need to increase access to early intervention in mental healthcare for older adults. This systematic review synthesized the evidence for the efficacy and acceptability of low-intensity psychological interventions (self-help, psychoeducation, bibliotherapy, internet cognitive-behavioral therapy: iCBT) for older adults with mild-to-moderate mental health problems. **Methods:** Ovid, EBSCOhost and ProQuest were searched for articles describing low-intensity psychological interventions. Pre and post outcome measures and a mean age of at least 50 (age range ≥40) were required for inclusion. **Results:** 26 articles (23 studies) described various interventions. Most studies were good quality and reported improvements in participant's mental health scores post intervention. Participants were more likely to be female, aged 60-70 and to be highly educated. Eight studies reported obtaining participant satisfaction ratings. Three studies included participants from rural areas. **Conclusions**: Low-intensity psychological interventions can be effective for older adults with mild-to-moderate mental health problems, but generalizability is constrained. **Clinical Implications**: Guided iCBT and bibliotherapy may be beneficial for adults in their 60s and 70s experiencing mild-to-moderate levels of depression. CBT may also be beneficial for reducing symptoms of mild-to-moderate anxiety. Providing the option of low-intensity psychological intervention, particularly iCBT, may help increase engagement with treatment.

Keywords: older adult; mental health; psychological intervention; psychoeducation; self-help, bibliotherapy, internet psychotherapy, CBT, low-intensity psychological therapy

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Introduction

In the context of a rapidly ageing population, health services are predicted to continue to fall short of meeting the needs of older adults worldwide (World Health Organisation: WHO, 2018a). Older adults experience similar rates of mental health problems to the general population (WHO, 2017), yet they are more likely to experience mental healthcare inequalities, due to under-identification(Lee, 2007), poor access to age-specific mental health services (Chaplin, Farquharson, Clapp & Crawford, 2015; Palinkas et al., 2007; Pettigrew, Donovan, Pescud, Boldy & Newton, 2010; Lievesley, 2009), and over-reliance on pharmacological interventions (American Psychological Association, 2017; Stickland & Gentry, 2016). This is despite self-reported medication fears (Wuthrich, Frei, Pachana, & Oude Voshaar, 2015), increased risks of polypharmacy (Cahir et al., 2010), and evidenced preference for psychosocial interventions (Cole, McCusker, Sewitch, Ciampi & Dyachenko, 2008). Once referred, older adults tend to have better engagement with, and outcomes following, psychological intervention than other adults (Chaplin et al., 2015).

Risk factors for mental health problems include bereavement, physical health difficulties and social isolation, all of which are especially pertinent to older adults (The Australian Government, 2006; WHO, 2017). Mental healthcare inequalities may stem from a range of issues including: practical barriers (such as transport and financial difficulties; Pepin, Segel & Coolidge, 2009), care provider difficulties in identifying mental health problems in older adults (Palinkas et al., 2007), stigma (Pettigrew et al., 2010) and poorer mental health literacy among older adults (Bonabi et al., 2016). A lack of timely and appropriate mental health intervention can exacerbate mental health problems (Mind, 2013). Over the past decade, government policies have highlighted mental healthcare for older adults as an area of priority (Mental Health Commission of Canada, 2012; The Scottish Government, 2016, Royal Australian and New Zealand College of Psychiatrists, 2011),

particularly in rural areas because accessibility can be especially problematic (National Healthcare Disparities Report, 2010; The Scottish Government, 2016). There is an identified need for timely, cost-effective mental health interventions for older adults including early intervention and preventative care (Lee, 2007; WHO, 2017).

Cohort effects including stoicism and differences in the language used to describe mental health between older adults and clinicians may deter older adults from seeking face-to-face support (Bryant, 2010). Therefore, self-help interventions may be of particular benefit to older adults due to their availability (e.g. no waiting times), accessibility (e.g. being available in client's own homes; Hobbs, Joubert, Mahoney & Andrews, 2018) and the relative privacy and autonomy such interventions afford. Low-intensity psychological interventions (e.g. self-help/psychoeducation) may help to increase access to timely mental health support for those with mild-to-moderate mental health problems (Mental Health Foundation, 2016; National Institute for Clinical Excellence, 2011; The Scottish Government, 2016). Psychoeducation involves "providing patients with information about treatment, symptoms and resources and training them to use strategies for coping with symptoms" (Tanaka, Ishikawa, Mochida, Kawano, Kobayashi, 2015 pp.196). Low-intensity psychological interventions are generally delivered remotely, use a resource (e.g. books, CDs, the internet) for the purposes of providing mental health information, and involve minimal contact with healthcare professionals (British Psychological Society, 2011).

The Matrix (2015) is an evidence review that guides commissioning for all mental health services in Scotland. It recommends bibliotherapy for mild depression and cognitive-behavioral therapy (CBT) for mild anxiety (Matrix, 2015). More recently, such 'self-help' interventions have been made available online (e.g. internet cognitive-behavioral therapy (iCBT); The Scottish Government, 2018). While reviews of the literature indicate that iCBT is highly efficacious for adult populations, little is known about the evidence base for older

adults (Andrews, Cuijpers, Craske, McEvoy & Titov, 2010). Crabb et al. (2012) completed a systematic review on iCBT for depression in older adults and found that on average only 3% of included participants were aged over 65 years. Promisingly, survey findings suggest that the number of older adults accessing the internet is increasing (Office of National Statistics, 2017) and that 45% of older adults from one UK health board indicated a willingness to use iCBT (Elsegood & Powell, 2008).

In a mental healthcare setting psychoeducation may help to facilitate client's autonomy and sense of competence, thereby increasing motivation and well-being. However, they may also perpetuate social isolation due lack of human contact. Furthermore, the increased likelihood of cognitive difficulties in older adults (Mental Health Foundation, 2016), and increased risk of depression in those who have a dementia (Singh-Manoux, 2017) raises concerns about the accessibility and appropriateness of distal interventions.

Few reviews of the literature have explored the efficacy of low-intensity psychological interventions for improving the mental health of older adults. Donker, Griffiths, Cuijpers and Christensen (2009) completed a meta-analysis of four studies utilizing brief psychoeducation with adults and concluded that these interventions can reduce symptoms of psychological distress. Furthermore, comprehensive reviews of mental health interventions including bibliotherapy for depressed older adults (Holvast, Massoudi, Oude Voshaar & Verhaak, 2017; Pinquart, Duberstein & Lyness, 2007; Scogin, Welsh, Hanson, Stump & Coates, 2005) concluded that bibliotherapy was effective at reducing symptoms of depression in older adults. However, these conclusions stem from review of the same small pool of 4 – 6 intervention studies, hence, the consistently reported outcomes in favor of this approach.

The aforementioned reviews did not explore or synthesize participant satisfaction as part of determining intervention effectiveness. This is recommended in intervention studies (Kaltenthaler, Parry, Beverley & Ferriter, 2008) and considered good practice for informing the evidence base (The Health Foundation, 2013). Furthermore, these reviews did not explore additional low-intensity psychological interventions for older adults (e.g. group discussion, audio interventions, iCBT) across mental health problems. Indeed, to our knowledge no systematic review on the evidence base for iCBT exclusively in older adults exists.

Aims

The aim of this review is to investigate the effectiveness of a broad range of low-intensity, psychological interventions on the mental health of older adults through systematic evaluation of the extant literature and to suggest clinical implications for the findings. The review questions are: (1) What are the effects of low-intensity psychological interventions on mental health outcomes (i.e. levels of depression, anxiety and/or psychological distress) in older adults? (2) Are low-intensity psychological interventions acceptable to older adults? (3) Whom are low-intensity psychological interventions evidenced to benefit?

Methods

The review protocol was registered on Prospero prior to formal screening and data extraction (registration number CRD42018086707).

Eligibility Criteria

Broad inclusion and exclusion criteria were employed in order to increase the sample size and examine a wide range of studies for qualitative synthesis. Inclusion criteria stipulated that participants had to be older adults (with a minimum cut-off of ≥40 years of age and a sample mean age of at least 50) with mild-to-moderate mental health problems as measured by tools validated for use with adults in general. Included intervention studies had to consist of low-

intensity (e.g. self-help, psychoeducation) psychological interventions for mental health difficulties rather than interventions for physical or cognitive difficulties. Finally, studies considered for inclusion had to measure pre- and post-intervention mental health. Studies involving psychoeducational interventions which were embedded within a more intensive therapeutic intervention (e.g. individualized or group CBT) or which used support groups were excluded.

Search Strategy

The following search terms: 1 (depress* OR anxi* OR "psychological distress" OR mood OR affective) AND 2 (psychoeducation OR "mental health literacy" OR "anxiety literacy" OR "depression literacy" OR "mental health first aid" OR bibliotherapy OR "mental health education" OR "self help") AND 3 (elder* OR "old aged" OR geriatric* OR senior* OR "older adult*") were run through Ovid (PsycINFO, Embase classic + Embase, MEDLINE-Epub ahead of print, In process, other non-indexed citations, 1946-present), EBSCOhost (CINAHL, ERIC) and ProQuest (ASSIA, Dissertations and Theses Global) until the 20th of July 2018. The terms were searched in the abstract or 'anywhere but full text' where possible. A second search using the terms (Internet* OR web* OR app) in the title was run with 'AND 1 AND 3' above on October 3rd 2018.

Selection

Titles and abstracts from all returned results were read and screened for inclusion by the first author. If eligibility could not be determined based on information in the abstract, the full article was read. The full texts (n = 101) of articles requiring further eligibility assessment were scrutinized in depth. Following this, all preliminarily accepted articles (n = 31) were read and discussed between the authors. Reference lists of included studies were screened for any additional studies (n = 8). Grey literature was sought but not found. Searches on Google and requests for any unpublished findings from authors of relevant studies (n = 2) yielded no

results. Finally, the third author (LH) screened a random sample of included articles (n = 6) and additionally those articles for which eligibility could not be established (n = 3), comprising one third of the total sample. Inter-rater agreement on whether to include articles in the review was found on 8/9 articles. The remaining article was re-analyzed, reviewed and excluded from this review. An overview of the selection process and reasons for exclusion are provided in Figure 1.

Data Extraction

Data was extracted according to the review aims. Changes in standardized mental health scores from pre- to post-intervention were sought and reported. If effect sizes (Cohen's *d*) were absent, these were calculated when possible. Information about publication year, study setting, population characteristics, details about the intervention and control conditions, sample sizes, outcome measures, and information regarding assessment of the risk of bias were extracted. In order to make meaningful comparisons across studies, more in-depth details about the type, nature and duration of the interventions were compiled. Finally, information about retention, compliance and participant satisfaction with the intervention were also compiled.

Quality Appraisal

In line with PRISMA guidelines, the methodological quality of all included studies was assessed using the Methodological Index for Non-Randomized Studies (MINORS) rating scale (Slim et al., 2003) and one item pertaining to ethical considerations taken from the Critical Appraisal Skills Programme checklist (CASP, 2018). The MINORS tool has good validity and reliability as a risk of bias assessment (Slim et al., 2003; De Vos-Kerkhof, Geurts, Wiggers, Moll, & Oostenbrink, 2015). Items on the MINORS tool were scored '0' for *not reported or not applicable*, '1' for *reported but inadequate* and '2' for *reported and*

adequate. In instances where items were not explicitly reported further details from the authors were sought (n = 2) and ratings were assigned based on extrapolated information.

A random sample of the included studies (n = 9; 33%) were assessed by two independent authors (ET & LH) for inter-rater reliability and led to an inter-rater agreement of 85.6%. Further consensus (96%) was achieved through discussion with the third author (LH) and the final 4% discrepancy was resolved following discussion with the second author (ET).

Insert here: Figure 1. Prisma Flowchart (Moher, Liberat, Tetzlaff, Altman, The PRISMA Group, 2009).

Results

Study Selection

As shown in Figure 1 the initial search (n = 922) finally resolved to 26 articles, describing 23 studies, meeting all inclusion criteria. The main reasons for exclusion pertained to the nature of the intervention described (e.g. non-mental health intervention or non-low intensity interventions such as group CBT).

Included Studies

Details of the study characteristics are summarized in Table 1. The publication dates among the 23 studies selected for review ranged from 1987 to 2018 with 16 published in the last decade. Study locations included the USA (n = 7), Canada (n = 4), Australia (n = 4), Netherlands (n = 4), UK (n = 2), Sweden (n = 1) and Romania (n = 1). All but one study, who recruited from residential homes, recruited participants from community settings. Most studies were randomized controlled trials (RCTs; n = 16) with the remaining studies using controlled trials (n = 3), pre-post (n = 2) or multiple baseline designs (n = 2). While most studies recruited participants using advertisements, several studies recruited a random sample

of participants from previous studies (e.g. Bichescu, Neuner, Schauer & Elbert 2007; Zautra, 2012), through referrals from healthcare professionals (e.g. Chew-Graham et al., 2007; Guirguis-Younger, Cappeliez & Younger, 2008; Joling et al., 2011; McMurchie, Macleod, Power, Laidlaw & Prentice 2013; O'Moore et al., 2018; Seeley, Manitsas & Gau, 2017) or used a combination of advertisements and referrals from healthcare professionals (e.g. Jones, 2016).

Most participants included in the study interventions were female (estimated percentage: 69.7%, range 12.5% - 92%) with only three studies having a higher percentage of male than female participants. The estimated mean age of participants in the intervention groups was 67.9 years of age (age range 40 – 96 years). Most studies (n = 19) had a lower age limit of at least 55 years of age: ≥55 (n = 4); ≥60 (n = 12); ≥65 (n = 2); ≥75 (n = 1) and four studies reported a lower age limit of ≥40 or ≥50 but had a mean age (Mage) of at least 50. Although participants in most of the included studies were drawn from self-selecting community samples, they can all be considered to be analogue samples (i.e. drawn from the community but with clinical symptoms). The utility of analogue samples has been evidenced to provide accurate and meaningful information about clinical samples (e.g. Abramowitze et al., 2014). The most common mental health problems reported in the studies were depression (n = 15), anxiety (n = 4), depression and/or anxiety (n = 2), post-traumatic stress disorder (PTSD; n = 1) and psychological distress (n = 1). Approximately half of the studies (n = 11) explicitly excluded participants who had a cognitive impairment and/or dementia. The remaining studies either did not report exclusion criteria relating to cognitive difficulties or excluded participants whose cognitive abilities may have been compromised due to taking substances (e.g. high alcohol intake, sedative medications) or as a result of schizophrenia/psychosis. All three of the studies that reported on participant ethnicity or race (Floyd, Scogin, McKendree-Smith, Floyd. D. & Rokke, 2004; Seeley et al., 2017; Shah,

2010) reported a Caucasian/white majority (range 88% - 97%). Of the 18 studies that reported on educational attainment, twelve studies reported that approximately half of their sample had engaged in higher education (estimated *M percentage* = 52%, range 41–75%). Three studies (Jones, 2016; Shah, 2010; Walker et al., 2010) reported the inclusion of participants from both urban and rural locations.

A wide range of outcome measures were used (n = 20) with the Hamilton Rating Scale for Depression (HRSD), Geriatric Depression Scale (GDS) and Patient Health Questionnaire (PHQ-9) most commonly used. Within the intervention modalities, 14 different outcome measures were used across bibliotherapy interventions (with the HRSD and GDS used in 5 of the 11 studies) and 12 outcome measures were used across the iCBT interventions (with the PHQ-9 used in 4 of the 7 studies). Twenty-one of the twenty-three studies used at least one mental health outcome measure that was valid for use with older adults. Twelve studies had follow-up measures from ≥ 3 months post intervention with measures collected at three months only (n = 5), six months (n = 1), 12 months (n = 4) and 24 months (n = 2).

Insert here: **Table 1.** Study Characteristics

Intervention characteristics

Table 2 shows an overview of the low-intensity psychological interventions included in this review. A wide range of intervention modalities and durations were reported across studies. Low-intensity psychological interventions consisted of iCBT (n = 7), bibliotherapy (n = 8), self-help (n = 4), psychoeducation (n = 2), and audio interventions (n = 2). Upon further investigation there was considerable overlap between interventions labelled as ‘self-help’ and those labelled as ‘bibliotherapy’; all but one ‘self-help’ intervention study (e.g. Lamers,

Bohlmeijer, Korte, & Westerhof, 2014) used written CBT or behavioral therapy resources as their intervention.

Twenty-one of the reported interventions were guided. Interventions were considered 'guided' if there was any contact from researchers/clinicians regarding the intervention during the intervention phase. Most guided interventions reported weekly contact with participants in order to offer guidance and monitor progress. However, some studies also reported the provision of support and encouragement. Guidance ranged from ≤5 minutes to 60 minutes per participant and was delivered via combinations of telephone, face-to-face and email.

All but one intervention (group-based; Bichescu et al., 2007) were completed remotely in the participants' own homes. Interventions spanned four weeks to 24 months, with as few as one and as many as 24 modules. Nine interventions were categorized as 'brief' (1-6 modules/sessions over 1-2 months), 13 as 'moderate' (7-12 modules/sessions over 1 - 4 months) and one as a longer term intervention (≥15modules over two years). Most interventions (n = 15) targeted mild-to-moderate depression while four interventions targeted anxiety. A total of three interventions targeted subthreshold anxiety and/or depressive symptoms.

Insert here: **Table 2.** Intervention details

Appraisal of Methodological Quality

Overall, the methodological quality of the studies can be considered to be good. As shown in Table 3 scores ranged from 12/16 – 15/16 for uncontrolled studies and from 15/24 to 22/24 for RCTs, with higher scores indicating higher methodological quality. Overall, areas of methodological strength were the inclusion of aims and hypotheses, prospective data collection, inclusion of a comparison group and use of endpoints appropriate to the aims of

the study. However, prospective power calculations were rarely reported across studies and statistical analyses for half of the studies are considered underpowered, highlighting an area of methodological weakness. Most studies used self-selecting methods of recruitment and did not seek to assess the representativeness of their sample. However, there was no apparent pattern between recruitment methods and study outcomes. Half of the studies reported obtaining ethical approval (n = 12) and an additional four studies reported obtaining signed consent. A further three studies mentioned ethical considerations but not whether ethical approval or signed consent was obtained. It was not possible to determine whether ethical approval or informed consent was obtained in four of the studies.

Methodological quality across the two main intervention groups (iCBT and bibliotherapy) was also appraised separately. The iCBT studies' methodological strengths were the inclusion of hypotheses, prospective data collection, low attrition rates and/or utilization of intention-to-treat analyses, prospective power calculations, follow-up period ≥ 3 months and the use of contemporary controls. Only two studies used an active control; the other studies used a waiting-list control (n = 3) or no control (n = 2). Whilst bibliotherapy studies' typically included hypotheses and prospective data collection, 7/11 studies were missing prospective power calculations.

Outcomes of Low-intensity Psychological Interventions

See Table 4 for an overview of the study outcomes. Fifteen of the 23 studies reported results that supported the use of the low-intensity psychological intervention, twelve of which reported statistically significant results. A further three studies reported mixed results with some outcomes reaching statistical significance. Five studies did not find any statistically significant results in favor of the low-intensity psychological intervention. Seven of the thirteen studies that obtained follow-up measures at ≥3 months reported that clinical outcomes were maintained. The remaining six studies reported non-significant results (n = 4)

or mixed results at follow-up (n = 2). Only one of these non-significant follow-up outcomes showed a reduction from post-treatment scores (Lamers, 2014). Nine (60%) out of the 15 studies targeting mild-to-moderate depression and three (75%) out of the four studies targeting anxiety showed statistically significant improvement for participants' mental health scores. However, two studies that targeted both anxiety and depression did not yield any statistically or clinically significant results.

Across the bibliotherapy interventions, six of the eleven studies reported findings in support of bibliotherapy for older adults. Three of these studies reported statistically significant results with large effect sizes (Cohen's $d \geq 0.8$) and one study reported statistically significant results but had small effect sizes (Cohen's $d \geq 0.2$; Landreville & Bissonnette, 1997). A further study reported mixed results and four studies reported results that had not reached statistical significance, two of which were supportive of intervention effectiveness but lacked statistical power. In contrast, all seven of the iCBT interventions reported statistically significant results in favor of the treatment group with all but one (Spek et al., 2007) reporting moderate-to-large effect sizes.

Several studies reported discrepancies between completers and non-completers. Oldest-old adults, those in assisted living (e.g. Joling et al, 2011; McMurchie et al., 2013) and participants with lower educational attainment (e.g. Scogin, Hamblin & Bentler, 1987; Scogin, Jamison & Gochneaur, 1989; Dear et al., 2012; McMurchie et al., 2013) were less likely to complete the interventions. Additionally, McMurchie et al. (2013) found that those who reported having more experience with, and greater confidence using, computers were more likely to complete the iCBT intervention. Conversely, one study (Scogin, Fairchild, Yon, Welsh & Presnell, 2014) reported that those with greater cognitive impairment were more likely to complete the bibliotherapy intervention.

Finally, of the 23 studies, eight studies obtained participant satisfaction feedback and/or ratings with all eight of these interventions receiving positive feedback. However, satisfaction was reported in various ways and without substantial detail. Retention and attrition rates can help to augment such findings. Although most studies reported on attrition rates, only half of the studies reported on how many participants completed all of the assigned intervention materials/modules. Compliance rates varied from 31% to 100%.

Insert here: **Table 3.** Quality Appraisal

Insert here: **Table 4.** Study outcomes

Discussion

There is an identified need for timely, cost-effective mental health interventions for older adults (WHO, 2017). Global initiatives have highlighted the need to find ways to better support older adults' mental health (Mental Health Commission of Canada, 2012; The Scottish Government, 2016, Royal Australian and New Zealand College of Psychiatrists, 2011). This review appraises the evidence of low-intensity psychological interventions for improving the mental health of older adults and sheds light on the types of interventions that have been tried and tested, including bibliotherapy, iCBT, internet-based life review, psychoeducation and audio-delivered CBT/mindfulness/cognitive therapy. The literature search suggests that interest in low-intensity psychological interventions for older adults has increased substantially in the past decade with most studies published during or after 2008. To our knowledge, this review is the first to systematically assess the quality and efficacy of iCBT interventions for older adults. Furthermore, an additional six studies describing bibliotherapy interventions (Chew-Graham et al., 2007; Dozeman et al., 2011; Guirguis-Younger et al.,2008; Landreville et al., 2016; Scogin et al., 2014; Seeley et al., 2017), not previously considered in other reviews (e.g. Holvast et al., 2017; Pinquart et al., 2007; Scogin et al., 2005), were identified and appraised in this review.

Outcomes

The findings from this review provide tentative evidence to support the use of guided, low-intensity psychological interventions for mild-to-moderate mental health problems in older adults in general. In particular, the use of both bibliotherapy and iCBT appear to be well-evidenced. The diversity of the remaining interventions included in the review hinders establishment of their wider efficacy and generalizability. Furthermore, given that almost all interventions were guided and involved some clinician contact, the appropriateness of low-intensity psychological interventions that are not guided remains unknown. As digital opportunities for self-guided interventions grow, and with it potential for financial profit for developers, systematic evaluation of such approaches should be prioritized.

Previous reviews unanimously supporting the efficacy of bibliotherapy for older adults used five (Floyd et al., 2004; Joling et al., 2011; Landreville & Bissonnette,1997; Scogin et al., 1989; 1987) of the 11 studies included here. The inclusion of an additional six studies that described bibliotherapy interventions has yielded results that are more heterogeneous. Indeed, while Holvast et al. (2017) included the bibliotherapy study by Joling et al. (2011) in their review they did not mention the non-significant findings in their conclusion but focused on the four studies that did report statistical significance. Interestingly, the two bibliotherapy interventions that targeted subthreshold anxiety and/or depression did not yield any significant results (Dozeman et al., 2011; Joling et al., 2011). It is possible that the outcome measures used were not sensitive enough to distinguish any change in scores and that a floor effect may have been present. Furthermore, these two studies both reported high attrition rates, relied on the same bibliotherapy materials '*Coping with Depression'* and used participants who were considerably older than in other interventions (e.g. *M*age >80 years). Therefore, the use of low-intensity psychological interventions for subthreshold symptoms in oldest-old adults is unsupported. Furthermore,

given that neither of the interventions which targeted both anxiety and depression demonstrated significant results, caution in delivering such interventions is recommended.

In line with self-management approaches (Crepaz-Keay, 2010; Deci & Ryan, 2015) the evidence suggests that guided, low-intensity psychological interventions do improve older adults' mental health as measured by clinician and self-reported screening and/or diagnostic tools. All the studies that reported significant results post-treatment and included follow-up measures at ≥3 months demonstrated maintenance of treatment gains at follow-up. Interestingly, although choice is considered an important aspect of mental health treatment (National Health Service, 2018; Raue & Sirey, 2011), RCTs are designed to reduce the bias that such choice might otherwise bring. Only one of the intervention studies (McMurchie et al., 2013) allowed participants to choose between the low-intensity (iCBT) intervention or treatment as usual, arguably providing a research environment that may more closely replicate a mental health service setting.

Acceptability

Given the increased risks of polypharmacy in this population (Cahir et al., 2010), the provision of alternative treatments for mental health problems is imperative. Overall, only one third of studies obtained feedback from participants about their satisfaction with the intervention. Although feedback was generally positive, such evidence usually relied on one or two questions and was sought informally. It is unclear whether anonymized methods for providing feedback were provided, and if this could have led to inflated satisfaction ratings. However, there is little evidence for social desirability affecting responses in this age group (e.g. Fastame, Penna, & Hitchcott, 2015) and social desirability as a whole is now a contested construct (Tracey, 2016). Nonetheless, retention and attrition rates can help to augment such findings, but there was a lack of detail in the studies included in this review. Future research should consider more nuanced and multi-faceted ways of measuring participant satisfaction

and acceptability as these are evidenced to contribute to intervention improvement (Mayston et al., 2017) and may be especially important indicators of intervention success for those who are completing such interventions remotely.

Target Populations

The evidence-base relies predominantly on female participants, those in their 60's, older adults with mild-to-moderate depression, those with higher educational attainment, who live in the community (often in urban areas) in developed, Western countries and who self-select to participate in intervention studies. Given that those who are female (Mackenzie, Gekoski & Knox, 2006) and who have higher educational attainment (Bonabi et al., 2016) are already more likely to access services, future research should strive to include equal numbers of male and female participants and participants from lower socio-economic backgrounds. Furthermore, only three studies explicitly recruited participants from both rural and urban areas. Given difficulties in mental health service accessibility (National Healthcare Disparities Report, 2010) and difficulties with internet infrastructure for those living in rural compared with urban areas (Duzaro et al., 2011) future research should strive to include rural-dwelling participants. This type of intervention is well-suited to better-educated individuals and as such, risks perpetuating or even accentuating social inequalities in healthcare access. We recommend that both intervention design and evaluation focus on making interventions accessible and attractive to people from diverse backgrounds, with regard to education, ethnicity and gender at a minimum.

Interestingly, almost half of the studies did not explicitly exclude those with cognitive impairment. Nevertheless, whether participants with cognitive impairment were in fact included in the intervention studies remains unclear. Psychological interventions may have differing effects on older adults with cognitive impairments compared with older adults without such impairments (Pinquart et al., 2007). Given that those with cognitive impairment

may be at increased risk of experiencing depressive symptoms (Singh-Manoux, 2017) it is particularly important for facilitators of low-intensity psychological interventions to (a) consider the usefulness of these interventions for those with comorbid cognitive and mental health difficulties and (b) evaluate how such interventions could be adapted in order to be inclusive of this client group.

Limitations

Half of the included studies reported statistically significant results in favor of the low-intensity psychological interventions, including all of the iCBT interventions. Although, the moderate-to-large effect sizes reported in the iCBT interventions are impressive, the iCBT studies relied predominantly on either comparison with waitlist controls or no comparison at all. Only half of the bibliotherapy interventions reached significance. Given that the bibliotherapy interventions had smaller sample sizes, due to higher attrition rates, than the iCBT interventions, it is possible that these analyses lacked statistical power to detect small effects.

Half of the included studies did not achieve adequate sample sizes which raises concerns about the reliability and generalizability of the findings and increases the chances of Type II errors. In particular, the studies on bibliotherapy reported the highest levels of attrition across interventions whilst the studies on iCBT did not report this difficulty despite having longer intervention times and follow-up times in general. One possibility is that the iCBT interventions were more interactive and engaging than the bibliotherapy interventions. However, a recent study comparing iCBT to bibliotherapy in an adult sample (Smith et al., 2017) found that attrition rates between these interventions did not differ. Participants in the iCBT intervention tended to be younger (*M*age = 64.4) than those in the bibliotherapy interventions (*M*age = 72.03) suggesting that age may have been a mediating factor.

However, Stein-Shvachman, Karpas and Werner (2013)'s review of attrition factors in depression treatment could not find a consistent association between age and attrition.

Interestingly, only half of the studies reported obtaining ethical approval. Given the increased vulnerability of the population samples used (older adults and those with mental health problems; WHO, 2018b) ethical considerations are paramount. Furthermore, older adults are at increased risk of cognitive impairment suggesting that informed consent deserves special consideration in research with, and interventions for, older adults.

Due to the wide range of outcome measures used and the inconsistent use of control groups across the evidence base for iCBT conducting a meta-analysis was not feasible. However, given that research on iCBT for older adults appears to be on the increase, completion of a meta-analysis may be an appropriate option in the near future.

There are several limitations of this review. Due to the limited number of studies describing low-intensity psychological interventions for older adults two compromises were made: Firstly, the minimum age limit falls below what can be considered to be 'older adult'. For example, studies which included participants aged ≥ 40 were included in this review as long as a mean age of ≥ 50 was reported for the total sample. Therefore, the findings are not strictly based on data from older adults alone. However, none of the bibliotherapy or iCBT interventions included participants under 50 years of age.

Secondly, this review included a wide range of low-intensity psychological interventions permitting that improved mental health was the primary target of the intervention. The heterogeneity of the interventions included in this review means that it is difficult to draw conclusions about all types of low-intensity psychological interventions.

Finally, we were unable to find any grey literature. Although three of the included studies did not report any statistically significant results, most did. It is possible that a publication bias is present in the older adult intervention literature whereby studies that do

not support the use of low-intensity psychological interventions are not submitted, or indeed accepted, for publication.

Conclusion

In conclusion, low-intensity psychological interventions focused on either treating depression or anxiety are likely to benefit older adults, in their 60s and 70s, who are experiencing mild-to-moderate depression or anxiety. More specifically, iCBT interventions were effective at reducing both anxiety and depression symptoms while bibliotherapy was only evidenced to be effective at reducing depression but not anxiety symptoms. The provision of clear information about what the low-intensity psychological intervention entails and the availability of clinician guidance and mental health monitoring throughout the duration of the intervention is essential. Future research should strive to better understand and reduce the mental healthcare inequalities between rural and urban populations by seeking involvement from rural-dwelling older adults. Increasing the availability of low-intensity psychological interventions to all will provide more options to mental health service consumers thereby promoting a less prescriptive approach to mental healthcare. This approach may help to facilitate autonomy and competence in older adult consumers.

Clinical Implications

- Guided iCBT and bibliotherapy are likely to benefit older adults in their 60s and 70s experiencing mild-to-moderate levels of depression.
- Guided iCBT is also likely to benefit older adults in their 60s and 70s experiencing mild-to-moderate levels of anxiety.

- The usefulness of such interventions for older adults (aged 80+), those with subthreshold symptoms, men and those from diverse socio-economic, educational and cultural backgrounds remains unsupported or unknown due to a limited evidence base.
- Providing the option of low-intensity psychological intervention, particularly iCBT, may help to increase participant engagement with treatment, and clinicians should ensure routine evaluation of satisfaction as well as effectiveness.

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Table 1. Study Characteristics

Author, Year & Setting	**Design**	**Intervention**	***N, M*age (SD/range) female %**	**Control**	***N, Mage* (SD/range) female %**	**Mental Health Measures (Primary Outcome Measure in bold)**	**Intervals**
Bichescu (2007) Romania, *Former political prisoners*	RCT	Group psycho-education session	*9,* 69.8 (6.0/55+) 12.5%	NET	*9* , 68.9 (4.4) 0.0%	**CIDI (PTSD section**), **BDI**	Pre & 6 mo FU
Chew-Graham (2007) UK, *Community*	Feasibility RCT	Guided CBT self-help	*53,* 75 (60-92) 39.0%	CAU	*52,* 76 (60-92) 37.0%	**SCID**, HSCL-20	Pre & 1 mo FU
Dear (2012) Australia, *Community*	Pre-post	Guided iCBT	*20,* 63.4 (5.1/60+) 65.0%	N/A	N/A	**PHQ-9, GDS**, GAD-7, K-10	Pre-post & 3 mo FU
Dozeman (2011) Netherlands *Residential homes*	Feasibility RCT	Guided BT self-help	*67,* 83.7 (6.7/60+) 68.7%	CAU	*62,* 84.2 (6.8) 80.6%	**CES-D, HADS-A**	Pre-post
Floyd (2004) USA, *Community*	RCT	Guided cog. bibliotherapy	**[***46,* 68 (60-80) 76.0%**]**	DT CP	Not reported	**HRSD, GDS**, BSI (GSI item)	Pre, mid, post & 3 mo FU
Guirguis-Younger (2008) Canada, *Community*	Multiple-baseline	Guided beh. bibliotherapy	**[***6,* (62-85) 33.0%**]**	N/A	N/A	**HRSD, GDS**	Pre, weekly, post & 3 mo FU

Joling (2011) Netherlands, *Community*	RCT	Guided CBT Bibliotherapy	*86,* 81.8 (3.8/75+) 69.8%	CAU	*84,* 81.1 (3.5) 77.4%	**CES-D**	Pre-post
Jones (2016) Canada, *Community*	RCT & PR	Guided iCBT	*24,* 64.8 (3.7/60+) 91.7%	WL	*22,* 65.5 (4.7) 81.8%	**GAD-7,** PSWQ-A, GAI, GDS, **PHQ-9**	Pre-post & 1 mo FU
Lamers (2014) Netherlands, *Community*	RCT	Guided, online life-review self-help	*58,* 56.3 (10.3/40+) 75.9%	WL expressive writing	*58,* 56.64 (9.1) 77.6% *58*, 56.86 (7.9) 77.6%	**CES-D,** HADS-A, MHC-SF	Pre, 2 wks post & 6, 12 mo FU
Landreville (2016) Canada, *Community*	Multiple-baseline	Guided CBT self-help manual	*3* 67.7 (65+)	N/A	N/A	**GAD-7, PSWQ-A , GAI**	Pre, baseline, 2 wks post & 6, 12 mo FU
Landreville (1997;98) Canada, *Community disability sample*	RCT	Guided cog. bibliotherapy	*10,* 71.8 (5.6/55+) 90.0%	DT	*13,* 72.15(7.0) 84.6%	**GDS, BDI, IDD**	Pre, post & 6, 12, 18, 24 mo FU
McMurchie (2013) U.K, *Clinical*	CT	iCBT	*33,* 71.6 (4.4/65+) 75.8%	CAU	*20,* 75.55 (6.3) 70.0%	GDS, GAI, CORE-34*	Pre, 2 mo, post & 1 mo FU
O' Moore (2018) Australia, *Community*	RCT	Guided iCBT & CAU	*44,* 63.2 (7.4/50+) 86.4%	CAU	*25,* 59.68 (6.0) 68.0%	**PHQ-9, K-10**, MINI	Pre-post & 3 mo FU

Scogin (2014) USA, *Community*	CT	Guided cog. bibliotherapy (GCB)	**[***53* , 68.4 (6.6/60+) 70.0%**]**	WL GCB & MT	Not reported	HRSD, GDS*	Pre, post & 1 mo FU
Scogin (1989 & 1990) USA, *Community*	RCT	Guided beh. bibliotherapy Guided cog. bibliotherapy	*23,* 70.3 (8.5/60+) 78.2% *22,* 66.9(5.30/60+) 90.9%	DT	*22,* 67.77 (6.5) 86.4%	HRSD, GDS*	Pre, post & 6, 24 mo FU
Scogin (1987) USA, *Community*	CT	Guided cog. bibliotherapy	*10*, 70.8 (60+) 80.0%	DT Logo-therapy book	*11,* 70.8 72.7% *8,* 68.5 87.5%	HSRD, BDI*	Pre, post & 1 mo FU
Seeley (2017) USA, *Clinical*	Feasibility RCT	Guided peer-facilitated CBT Workbook	**[***62* , 74.2 (10.7/ 55+) 81%**]**	WL	*31* Not reported	PHQ-9, GAD-7*	Pre-post
Shah (2010) USA, *Community*	RCT	Guided audio CBT & workbook	*17,* 65.7 (8.5/55+) 76.5%	DT	*17,* 61.53(5.57) 82.4%	**GDS, HRSD, BSI**	Pre-post
Silfvernagel (2018) Sweden, *Community*	RCT	Guided iCBT	*33,* 66.7 (60-77) 66.7%	Clinician attention	*33,* 65.5 (60-73) 84.8%	**BAI**, PHQ-9, GAD-7, MADRS-S, CORE	Pre-post & 12 mo FU
Spek (2007 & 2008) Netherlands, *Community*	RCT	iCBT	*102,* 55 (4.9/50+) 67.6%	WL Group CBT	*100,* 55(5) 59.0% *99,* 54(3.9) 63.6%	**BDI**	Pre-post & 12 mo FU

Walker (2010) Australia, *Community*	RCT	Guided mental health literacy modules	*452,* 66.1 (4.3/60+) 59.7%	Pain info modules	*448,* 65.78 (4.2) 60.7%	**PHQ-9**	Pre, 6 wks , 6, 12, post (24 mo)
Zautra (2012) USA, *Community*	RCT	Guided cog. therapy Mindfulness voicemail	**[***73*, 54 (6.5/40+) 82%**]**	Physical health tips	*24* Not reported	DDS (3 item), SF-36 emotional subscale, negative & positive affect scale*	Daily
Zou (2012) Australia, *Community*	Pre-post feasibility trail	Guided iCBT	*22,* 66 (4.6/60+) 68%	N/A	N/A	**GAD-7, DASS-21**, PHQ-9, K-10	Pre-1 wk post & 3 mo FU

Note. **beh** = behavioural; **CAU** = care as usual/ **cog** = cognitive; **CP** = cognitive psychotherapy **CT** = controlled trial; **DT**= delayed treatment; **FU** = follow-up; **GCB** = guided cognitive bibliotherapy; **MT** = memory training; **N/A** = not applicable/ **NET** = narrative exposure therapy; **PR** = partial replication; **RCT** = randomised controlled trial; **WL** = waiting-list; **[ ]** = overall *N, Mage (SD/range), female %.* Measures: **BDI** = Beck Depression Inventory/**BSI** = Brief Symptom Inventory/**CES-D** = Centre for Epidemiological Studies Depression/**CORE-34** = Clinical Outcomes in Routine Evaluation/**CIDI** = Composite International Diagnostic Interview/**DASS-21** = Depression Anxiety Stress Scales/**DDS** = Daily Depression Scale/**GAD-7** = Generalised Anxiety Disorder 7-item Scale/**GAI** = Geriatric Anxiety Inventory/**GDS** = Geriatric Depression Scale/**GSI** = Global Severity Index/**HADS-A** = Hospital Anxiety and Depression Scale/**HRSD** = Hamilton Rating Scale for Depression/**HSCL-20** = Hopkins symptom checklist for depression /**IDD** = Inventory to Diagnose Depression/**K-10** = Kessler 10-item Scale (psychological distress)/**MADRS-S** = Montgomery Asberg Depression Scale Self-Rated/**MHC-SF** = Mental Health Continuum Short Form/**PHQ-9** = Patient Health Questionnaire (depression)/**PSWQ-A** = Penn State worry questionnaire-abbreviated/**SCID** = structured clinical interview for DSM IV depression/**SF-36** = Rand 36-item Short Form Health Survey. ***** = No primary outcome measure identified – all measures used in analysis

Table 2. Intervention details

	Author & Year	Diagnosis Targeted by Intervention	Intervention, duration, # sessions, length & clinical contact
BIBLIOTHERAPY	Chew-Graham (2007)	Dep	CBT self-help 'SHADE manual'; 12 wks 6 Ff & 5 Tel (psychoeducation & signposting)
	Dozeman (2011)	Dep/Anx [a]	BT: *Coping with Depression;* Activity Scheduling; 4s 2-5 Ff, guidance/monitoring only [b]
	Floyd (2004)	Dep	CT *'Feeling Good'*; 4 wks 4 Tel ≤ 5 min, guidance/monitoring only
	Guirguis-Younger (2008)	Dep	BT '*Control your Depression*'; 6 wks/6s 6 Ff ≤ 15min (provided support and clarified material)
	Joling (2011)	Dep [a]	CBT leaflet & '*Coping with Depression*'; 12 wks 3 Ff ≤ 60min & 2 Tel, guidance/monitoring only
	Landreville (2016)	GAD	CBT self-help manual; 15 wks/ 8s 2 Ff & 15 Tel (30min) guidance/monitoring only
	Landreville (1997; 1998)	Dep	CT '*Feeling Good'*; 4 wks 4 Tel (15min), guidance/monitoring only

	Scogin (2014)	Dep	CT '*Feeling Good'* + memory training; 4 wks/24x1hr 4 Tel (10min), guidance/monitoring only [b]
	Scogin (1989;1990)	Dep	BT '*Control your Depression'*/CT '*Feeling Good'*;4wks 4 Tel (≤ 5mins), guidance/monitoring only [b]
	Scogin (1987)	Dep (mild-mod)	CT '*Feeling Good'*; 4 wks 4 Tel (10min), guidance/monitoring only [b]
	Seeley (2017)	Dep/Anx (mild-mod)	CBT Workbook '*5 Areas'*; 10s 10 Ff (weekly), guidance only
iCBT	Dear (2012)	Dep	iCBT '*Managing your Mood*'; 8 wks Email (16 automated & 1.6 manual pp) & Tel (36.1min pp)
	Jones (2016)	GAD [a]	iCBT '*GAD online for older adults*' 7s 7 Online 'check in' & weekly email (guidance & support)
	McMurchie (2013)	Dep	iCBT '*Beating the Blues'*; 8 wks/ 8x1hr No clinical contact
	O'Moore (2018)	MDD	iCBT sadness programme + CAU; 6s Email contact to answer questions
	Silfvernagel (2018)	Anx	individually tailored iCBT; 8 wks Email feedback on homework
	Spek (2007; 2008)	Dep	iCBT; 8wks/8s No clinical contact

	Zou (2012)	Anx (mild+)	iCBT '*Managing Stress and Anxiety*'; 8 wks, 5s Online discussion forum + automatic emails (*M* = 17.23) & weekly tailored email (*M* = 1.23) /Tel
Internet LR	Lamers (2014)	Dep (mild-mod)	Online life review '*The stories we live by'* 10 wks/7s Weekly emails (guidance, encouragement & questions)
PE	Bichescu (2007)	PTSD	1 group session of psychoeducation regarding the nature and prevalence of PTSD
	Walker (2010)	Elevated distress	Mental health literacy; 24 mo/15modules 5 Tel, guidance & motivate engagement [b]
AUDIO	Shah (2010)	Dep	Audio CBT '*making the golden years golden again*' & workbook, 1 mo/8x 30-60min CDs 4 Tel (weekly) [b]
	Zautra (2012)	Dep (mild+)	CT: 'Personal Mastery'; 27 days, daily 1 Ff (psychoeducation) & daily automated Tel (monitoring/ encouragement) 'Mindful Awareness'; 27 days,

									1 Ff (2 brief mindfulness exercises) & daily automated guided - meditation voicemails

Note. **Anx** = anxiety; **BT** = behavioural therapy; **CD** = compact disk; **CT** = cognitive therapy; **Dep** = depression; **Ff** = face-to-face; **GAD** = generalised anxiety disorder; **m** =modules; **MDD** = major mood disorder; **mod** = moderate; **PE** = Psychoeducation; **pp** = per person; **PTSD** = post traumatic stress disorder; **s** = sessions; **Tel** = telephone; **wks** = weeks.

[a] = subthreshold; [b] = counselling prohibited.

Table 3. Quality Appraisal

	Author & Year	Aim	Sample	Data	Endpoints	Blindness	Follow-up	Attrition	Power	Control	Time	Baseline	Analyses	Total /24	Ethics (CASP)
BIBLIOTHERAPY	Chew-Graham[2] (2007)	1	2	2	1	2	2	2	2	1	2	2	2	**21**	Ethical approval acquired
	Dozeman[1] (2011)	2	2	2	1	2	2	1	2	1	2	2	1	**20**	Ethical approval & Informed consent obtained
	Floyd[3] (2004)	2	2	2	2	1	2	1	0	2	2	2	2	**20**	Cannot tell
	Guirguis-Younger[4] (2008)	2	1	1	2	1	2	2	0	1	1	0	2	**15**	Cannot tell
	Joling[1] (2011)	2	2	2	1	1	0	2	0	1	2	2	2	**17**	Ethical approval acquired
	Landreville[4] (2016)	2	1	2	1	1	2	1	0	0	0	0	2	**12**	Do not state ethical approval status. Signed consent obtained
	Landreville[3] (1997; 1998)	2	1	2	2	1	1	0	0	1	2	2	1	**15**	Cannot tell
	Scogin[1] (2014)	2	1	2	2	2	1	1	0	2	2	2	2	**19**	Ethical approval acquired Informed consent obtained
	Scogin[3] (1989; 1990)	2	1	2	2	1	2	1	0	2	2	2	2	**19**	Signed consent obtained
	Scogin[3] (1987)	2	1	2	2	1	1	1	0	1	1	2	1	**16**	Those in WL group were provided with treatment after 2nd assessment
	Seeley[1] (2017)	1	2	2	1	1	0	2	1	1	2	2	1	**16**	Signed consent obtained. Excluded participants who required immediate services
iCBT	Dear[3] (2012)	2	2	2	1	1	2	2	0	0	0	0	1	**13**	Ethical approval acquired
	Jones[3] (2016)	2	2	2	1	1	1	2	2	1	2	2	2	**20**	Phoned by clinician if inactive online for 1 week
	McMurchie[3] (2013)	1	1	1	1	1	1	2	2	1	2	1	2	**16**	Participants self-selected intervention assignment
	O'Moore[3] (2018)	2	1	2	2	2	2	2	2	1	2	2	1	**21**	Ethical approval & Informed consent obtained. Telephone check-in if mood deteriorated

	Silfvernagel[3] (2018)	2	2	2	1	1	2	2	0	2	2	1	1	**18**	Cannot tell
	Spek[3](2007; 2008)	2	2	2	1	1	2	2	2	2	2	2	2	**22**	Ethics approval acquired & Informed consent obtained
	Zou[3] (2012)	2	2	2	1	1	2	2	2	0	0	0	1	**15**	Ethics approval acquired
iLR	Lamers[3] (2014)	2	2	2	1	1	2	2	2	2	2	2	2	**22**	Ethical approval &Informed consent obtained
	Bichescu[4] 2007)	2	2	2	1	1	2	2	0	2	2	2	1	**19**	Ethical approval acquired
PE	Walker[1] (2010)	2	2	2	1	2	0	2	2	2	2	2	2	**21**	Ethics approval acquired & Informed consent obtained
AUDIO	Shah[2] (2010)	2	2	2	2	2	0	2	2	1	2	2	2	**21**	Ethics approval acquired & Informed consent obtained. Adverse events protocol in place
	Zautra[2] (2012)	2	1	2	1	2	0	1	0	2	2	2	2	**17**	Informed consent obtained

Note. **Aim** = A clearly stated aim; **Sample** = Inclusion of patients, **Data** = Prospective collection of data, **Endpoints** = Endpoints appropriate to the aim of the study, **Blindness** = Unbiased assessment of the study endpoint, **Follow-up** = Follow-up period appropriate to the aim of the study, **Attrition** = Loss at post treatment *(not follow-up)* less than 5%, **Power** = Prospective calculation of the study size, **Control** = An adequate control group, **Time** = Contemporary control groups, **Baseline** = Baseline equivalence of groups, **Analyses** = Adequate statistical analyses, **Ethics** = Have ethical issues been taken into consideration?

iLR = Internet based life review; **PE** = Psychoeducation; **WL** =waiting-list.

[1] = non significant; [2] = mixed results; [3] = significant results; [4] = supportive results;

Table 4. Study outcomes

	Author & Year	*N* *n*	Uptake/Retention/Compliance	Intervention outcomes [effect sizes]	Participant satisfaction
BIBLIOTHERAPY	Floyd[1] (2004)	[46]	67.39% retention	HRSD: F (1,25) = 13.20*, d = 1.38 GDS: F (1,25) = 8.01*, d = 0.80 *3 mo follow-up* HRSD: F (1,11) = 6.31*, d = 0.84 GDS: *ns*	
	Landreville[1] (1997 & 1998)	[23] 10	46.7% compliance (range 6.7-100%)	GDS: F(1,21) = 5.46* ***[****d = 0 .18****]*** IDD: F(1,21) = 5.71****[****d = 0.28****]*** BDI: F (1,21) = 14.56*****[****d = 0.03****]*** *24 mo follow-up* GDS, F(5,50) = 4.12** IDD, F(5,50) = 10.04*** BDI, F(5,50) = 4.38**	56.5% found book useful post tx
	Scogin[1] (2014)	[53]	65% retention	*ns*	
	Scogin[1] (1987)	[29] 10 11	CB = 90% retention delayed CB = 82% retention Compliance (7-point scale): CB = (4.7) delayed CB = (3.7)	HRSD: (20.64**) GDS: (3.82*) BDI: *ns* SCL-90: (9.09**) *Bibliotherapy vs WL* ***[****d = 1.2 - 1.8; 1 mo follow-up = 0.2 – 0.8****]*** [a] *Bibliotherapy vs control* ***[****d = 0.8 - 1.0; 1 mo follow-up = 0.3 – 0.9****]*** [a]	Satisfaction (7-point scale): CB = 6.5, delayed CB = 5.3, logotherapy control = 5.5
	Dozeman[2] (2011)	[129] 67	86% uptake; 21% retention 31% compliance	*ns*	57% rated (3-item, 10-point scale) as moderate-very good (M = 6.3 (SD =2.2)

Joling[2] (2011)	[170] 86	79% retention 41% compliance	*ns*	
Guirguis-Younger[3] (2008)	6	100% retention	N/A	
Scogin[3] (1989 & 1990)	[67] 23	91% retention 85% (5-100%) of books read	Bibliotherapy vs DT HRSD: F(1,59) = 34.91* GDS: F(1,59) = 8.09* Cognitive Bibliotherapy HRSD: F(1,40) = 25.65* ***[****d =0 .97****]*** GDS: F(1,37) = 10.65****[****d = 0.27****]*** Behavioural Bibliotherapy HRSD: F(1,38) = 20.16*) ***[****d = 1.5****]*** GDS: *ns*	
Chew-Graham [4] (2007)	[105] 53		*1 mo follow-up* SCID: ES = 0.32 (95% [CI] = 0.11 to 0.95* HSCL-20: *ns*	Intervention was acceptable to most participants (semi-structured interview)
Landreville [4] (2016)	3	100% retention	Reliable change index scores per participant >1.96 PSWQ-A: (-8.15, -6.11, -6.62) GAD-7: (-6.34, -2.72, -4.98) GAI: (-4.14, -3.01, -4.51) GDS: (-5.82, -5.50, -2.59)	Intervention was acceptable to most participants (semi-structured interview)
Seeley [4] (2017)	[62] 31	89% retention	PHQ-9: *d* =0.43, *ns* GAD-7: *d* = 0.28, *ns* *MCID score* PHQ-9: (OR = 4.89, 95% CI [1.48, 16.12]** GAD-7: *ns*	*M* (SD) satisfaction (4-point scale) = 3.1 (0.9). 100% reported they would recommend it to others

iCBT	Dear (2012)	20	80% retention	PHQ-9: (t_{19} = 5.41***) GDS: (t_{19}= 5.98***) GAD-7: (t_{19} = 4.23***) K-10: (t_{19}= 5.29***)	82% satisfied with intervention (two binary questions: recommend to a friend/worth their time)
	Jones (2016)	[66] 24	91% retention	*Pre - post & pre - 3 mo follow-up* [a] PHQ-9 & GDS: *d* range = 1.17 - 2.04 GAD-7: z = -2.28**, *d* = .85 PHQ-9: z = -2.83**, *d* = 1.17 PSWQ-A: z = -3.57*** *d* = 0.77 GAI: z = -3.64*** *d* = 0.82 GDS: z = -3.85*** *d* = 0.78	
	McMurchie (2013)	[58] 33	56.9% uptake 72.7% retention	*1 mo follow-up* [a] GAD: (t(17) = 1.91*) reduced Other scores maintained GDS: (t(51) = 2.96**, *d* = 0.85 GAI: (t(51) = 2.05*, *d* = 0.59 CORE: (t(51) = 2.92**, *d* = 0.84 *1 mo follow-up* GDS: t(51) = 2.78**, *d* = 0.80 GAI: t(51) = 2.40*, *d* = 0.69 CORE: t(51) = 2.23*, *d* = 0.61	
	O'Moore (2018)	[69] 44	84% retention	PHQ-9: *F*[3,191.03] = 9.82***, Hedges *g* = 1.01 K-10: *F*[3,190.06] = 6.37***, Hedges *g* = 0.75 *3 mo follow-up* [a] PHQ-9: Hedges *g* = 0.90 K-10: Hedges *g* = 0.94	95% 'somewhat' – 'very' satisfied

	Silfvernagel (2018)	[60] 33	67% retention 33% compliance	BAI: $F(1,57.0) = 4.7$*, $d = 0.50$ GAD-7: $F(1,52.6) = 5.6$*, $d = 0.67$ MADRS-S: $F(1,53.0) = 8.3$**, $d = 0.61$ PHQ-9: $F(1,56.1) = 8.75$**, $d = 0.62$ CORE-OM: $F(1,55.2) = 7.2$**, $d = 0.83$ *12 mo follow-up* [a] *d* range = 0.63 – 1.13	
	Spek (2007 & 2008)	[301] 102	64% retention 78.1% compliance	iCBT vs. WL: BDI: *ES* ($d_{improvement}$) = .55* ***[****d* = 0.26***]*** *12 mo follow-up* BDI: *ES* ($d_{improvement}$) = .53* ***[****d* = 0.26***]***	
	Zou (2012)	22	100% retention	GAD-7:$t_{21} = 7.03$***, $d = 1.65$ DASS-21: $t_{21} = 5.99$***, $d = 1.54$ PHQ-9: $t_{21} = 5.17$***, $d = 1.22$ K-10: $t_{21} = 8.30$***, $d = 1.23$ *3 mo follow-up* [a] GAD-7: $d = 1.03$ DASS-21: $d = 0.98$ PHQ-9: $d = 0.53$ K-10: $d = 0.69$	All participants rated the intervention as worthwhile
Internet LR	Lamers (2014)	[174] 58	75.9% retention	CES-D: $d = 0.35$** MHC-SF emotional: $d = 0.16$* MHC-SF psychological: $d = 0.27$* HADS-A: *ns* *LR vs. control at 12 mo follow-up* [a] CES-D: $d = 0.16$ MHC-SF emotional: $d = 0.01$ MHC-SF psychological: $d = -0.29$	*M* (SD) satisfaction (10-point scale) = 7.3 (1.27)

				HADS-A: t = 2.42*, d = 0.06 (reduction)	
PE	Bichescu (2007)	[18] 9	100% retention	*ns*	
	Walker (2010)	[909] 452		*ns*	
AUDIO	Shah (2010)	[34] 17	85.3% retention 66% compliance	HRSD: $F(1,31)$ = 4.14*, d = 0.87 GDS: *ns*	80-95% satisfaction (9-item satisfaction questionnaire)
	Zautra (2012)	[73]	CT = 79.31% compliance MA = 75.86% compliance	CT Depression: β = -.065 (.145)*** Negative affect: β = -.037 (.154)*** Role emotion subscale: β = 1.397 (.027)* Positive affect: *ns* MA Depression: β = -.052 (.099)*** Negative affect: β = -.024 (.020)* Role emotion subscale: β = 1.586 (.045)** Positive affect: : β = .058 (.130)***[b]	Both interventions were favourably appraised by participants

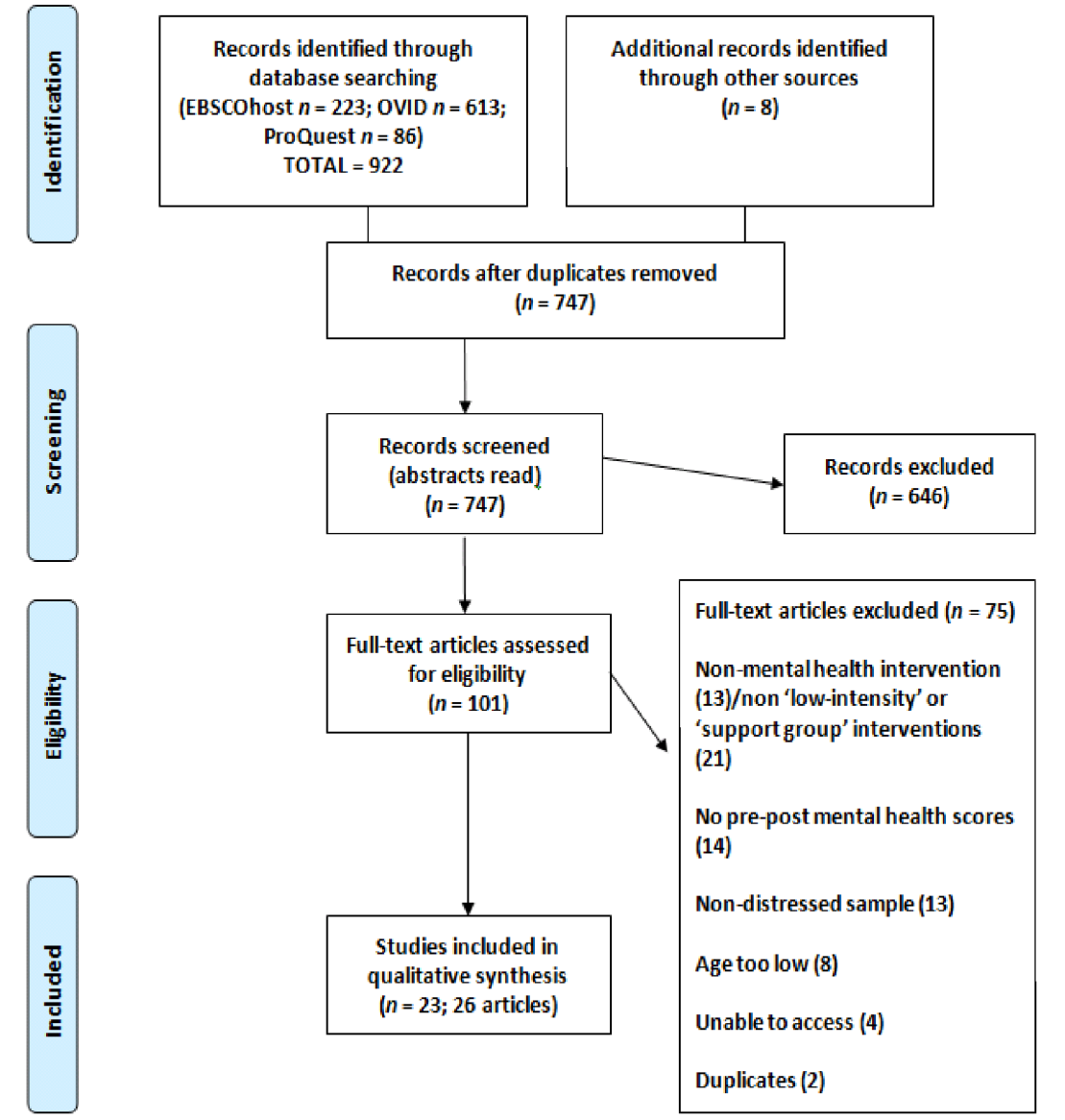
Note. **CB** = cognitive bibliotherapy; **CT** = cognitive therapy; **DT** = delayed treatment; ***d*** = Cohen's d; ***[ ]*** = calculated Cohen's d; **ES** = effect size; **LR** = Life Review; ***M*** = mean; **MA** = mindful awareness; **MCID** = minimal clinically important differences; **PE** = Psychoeducation; **SD** = standard deviation; **tx** = treatment; **WL** = waiting-list. Measures: **BDI** = Beck Depression Inventory/**CES-D** = Centre for Epidemiological Studies Depression /**CORE-34** = Clinical Outcomes in Routine Evaluation/ **CIDI** = Composite International Diagnostic Interview/**DASS-21** = Depression Anxiety Stress Scales/**GAD-7** = Generalised Anxiety Disorder 7-item Scale/**GAI** = Geriatric Anxiety Inventory/**GDS** = Geriatric Depression Scale/**HADS-A** = Hospital Anxiety and Depression Scale/**HRSD** = Hamilton Rating Scale for Depression/**HSCL-20** = Hopkins symptom checklist for depression /**IDD** = Inventory to Diagnose Depression/**K-10** = Kessler 10-item Scale (psychological distress)/**MADRS-S** = Montgomery Asberg Depression Scale Self-Rated/**MHC-SF** = Mental

Health Continuum Short Form/**PHQ-9** = Patient Health Questionnaire (depression)/**PSWQ-A** = Penn State worry questionnaire-abbreviated/**SCID** = structured clinical interview for DSM IV depression.

[1] = '*Feeling Good'* resource; [2] = '*Coping with Depression*' resource; [3] = '*Control your Depression*' resource; [4] = miscellaneous.

[a] Treatment gains maintained but no *p* values present [b] = effect sizes in parentheses.

* $p \leq .05$; ** $p \leq .01$; ***$p \leq .001$.



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Figure 1: PRISMA Flow Diagram